Austrian Republic

Letters Patent

According to the patent law
the patent with the number

226105

for the invention described in the enclosed
patent publication
was granted to
Karl Heesemann
in Bad Oeynhausen-Rehme (Germany)

Wien in February 25, 1963
(Seal)

Austrian Patent Office
Patent Register
Signature

The annuities become due every year on 15th of July .

Cl. 67a, 25

Austrian Patent Office

Patent Publication No. 226105

issued on February 25, 1963

KARL HEESEMANN
IN BAD OEYNHAUSEN-REHME (GERMANY)

Belt Sanding Machine

applied for in April 12, 1957 (A5571/59; claimed priority of the application in Germany dated December 8, 1956.
Beginning of the patent term: July 15, 1962

The present invention concerns a preferably automatic belt sanding machine for large-surface workpieces with a circulating, endless sanding belt pushed through an endless, circulating belt of steel, textile or plastic acting on its inner surface by means of a pressure device against the workpiece to be sanded and preferably to be continously moved vertically to the longitudinal direction of the sanding belt.

With the normal belt sanding machine including sliding table the sanding pressure on the sanding belt is transferred/exerted by a pressure piece, the width of which corresponds approximately to the width of the sanding belt and which has a length of approximately 300 mm.

It was tried to simply elongate such a pressure piece in order to obtain an increased efficiency. However, in practice it is not realizable, because in the process the sanding belt - especially with long workpieces - acts on such a great surface at once and is consequently under such a tensile force, that the tensile strength of the belt is not up to this stress anymore. Moreover, the discharge of dust becomes practically impossible due to the long sanding travel.

As far as it is already known to connect a short circulating endless pressure belt with elastic pressure webs between a short pressing plate and a circulating endless

sanding belt, such an arrangement does not allow to sand a large-surface workpiece without overstraining the sanding belt caused by the strong tensile force. This short pressure belt circulating between a short pressing plate and the endless sanding belt serves only as abutment for the sanding belt and reduces its friction with respect to the pressing plate. The relatively thick webs made of rubber or the like on such a pressure belt provides the pressure belt with a certain inflexibility so that a necessary levelling on a large surface to be sanded through the pressure belt cannot be effectuated. Furthermore, the back pressure rises increasingly in a disadvantageous manner inside such an elastic web depending on the pressure way.

In order to reduce the friction it is also known to provide the surface of a plate pressing on the inner surface of the sanding belt with glass beads or to connect a steel belt between sanding belt and pressing plate. Such measures alone are in no way sufficient for sanding large-surface workpieces.

The object of the invention is to provide a belt sanding machine for large-surface workpieces, the sanding belt of which acts practically over the entire length of the workpiece without being overstrained and without impeding the discharge of dust. The sanding shall run in the direction of the wood fibre as far as veneer plates and suchlike are concerned.

This object is achieved according to the invention in that way that lamella-like pressure strips of glass beads and suchlike are arranged on the outer surface of the steel belt or the like and that the pressure device is formed as an elastic pressure beam assuming the sanding length.

By means of such a construction it is advantageously achieved that the elastic pressure beam absorbs all unevennesses and due to this levelling, ensures a constant sanding pressure or surface pressure over the entire sanding length. A pressure belt like a steel belt, textile belt or plastic belt with lamella-like strips, which cannot be compressed due to the glass beads and suchlike, is comparatively light and thus can be tensed without sagging; it also adapts well to the surface of the workpiece to be sanded. The sanding dust coming up and the sanding heat are favourably led away.

Thus, the pressure belt with the lamella-like strips fulfils the function, during its support against the elastic pressure beam, to cause the sanding belt to act only on one part of the respective surface to be sanded, i. e. belt width times workpiece length, by its constant circulation in such a way, that the workpiece is sanded over its entire length.

In the process the elastic pressure beam arranged above the pressure belt does not exert directly the pressure onto the sanding belt, as with known belt sanding machines hitherto, but serves only as abutment for the pressure belt with the pressure strips. The pressure on the sanding belt is not exerted in a stagnant manner, but in a continuously moving and finely distributed manner in intervals over the entire length of the workpiece. Thereby, the quality of the sanding and also of the sanding performance can be substantially improved.

Such an arrangement impedes to sand straight-through also finest face veneers due to the equal contact pressure of the pressure strips.

The drawing shows an example of an embodiment of the invention, in which fig. 1 is a schematically front view of an automatic belt sanding machine with a circulating pressure belt, fig. 2 is a plan view of the same machine, fig. 3 is a section view of the same machine according to the line X-X in fig. 2, fig. 4 is a pressure belt with V-shaped pressure strips in a side view and fig. 5 is a plan view of the outer surface of the same pressure belt.

The belt sanding machine shown in fig. 1 shall explain the principle construction of such a machine. The supporting stands 10 and 11 of the belt sanding machine carry on angle irons the guiding rods 12, on which the main supporting table 14 for the workpiece 15 to be sanded is arranged in a horizontally slidable manner by means of rollers 13.

On the supporting stands 10 and 11 are belt pulleys 16 and 17, around which an endless sanding belt 18, which is provided with an abrasive layer on its outer surface, runs in the direction of the arrow, e. g. with a velocity of 25 m/sec. In the process the belt pulley 16 is driven by a motor 19.

A pressure belt 23 runs on the inner surface of the sanding belt 18 around the belt drum 21, which is driven in arrow direction by the motor 20, and around the free running belt drum 22. The pressure belt 23 consists of a basic body 24 made from thin shaped flat steel, which can be as wide as the sanding belt 18. However, the pressure belt can be made from textile fabric, plastic or the like corresponding to its purpose. Onto the outer surface of this basic body 24 thin (lamella-like), V-shaped pressure strips 25 spaced from each other in equal intervals are adhered, the surface of which (pressing surface) is formed by e. g. fine glass beads, and thus shall present a reduced friction coefficient and a high wear resistance. In particular, these pressure strips 25 are self-rigid, that means they are inelastic in the pressure direction; they have preferentially a width from 5 to 20 mm and can be of different thickness; already a thickness of 0.5 to 1 mm satisfies the made requirements. Due to the reduced thickness of the lamella-like pressure strips 25 the entire pressure belt 23 has such a reduced weight that it runs as slightly as the sanding belt 18. The velocity of the pressure belt 23 is for example 3 to 5 m/sec. It runs at a constant velocity, but at a slower rate than the sanding belt 18, with the latter in the same direction.

For sanding, on the inner surface of the lower part of this pressure belt 23 acts an elastic pressure piece 26, which can be moved vertically to the sanding level via the lever 27 by a piston or another device 28. This pressure piece 26 being in its lower position pushes the pressure belt 23 with the V-shaped pressure strips, which point into the running direction, against the sanding belt 18. In this process, the pressure against the inner surface of the sanding belt 18 is realized in such a way that it slides strip by strip with its outer surface over the workpiece to be sanded. Due to the interspaces 29 between the lamella-like pressure strips 25, the sanding belt 18 contacts only partially the surface to be sanded. Therefore, the sanding dust is discharged laterally, so that a finish sanding of a surprising quality can be achieved. A great sanding width results in a relatively low frictional resistance, whereby the pressure belt 23 is under relatively low tension. Therefore, it is possible to abstain completely from guiding means for the pressure belt 23, since the own tension of the pressure belt 23 is sufficient for good running properties during sanding.

If instead of the lamella-like pressure strips 25 greater and stronger pressure strips are arranged on the basic body 24, which serves as tension belt and guiding belt, it can be suitable to guide the pressure for example from the sides.

The pressure strips, in particular the lamella-like pressure strips, can be formed also curved or wavelike; they also can be replaced by a single pressure strip, which is fixed in zigzag or in a wavy line on the pressure belt in its longitudinal direction.

In order to obtain an absolutely uniform pressure on the individual pressure strips 25 of the pressure belt 23, the elastic pressure beam 26 can be fabricated in a single piece, so that there are no lugs. In order to achieve a good elasticity, an intermediate layer made from foamed rubber or rubber-sponge is usefully arranged at the pressure beam 26. The respective sanding length can be defined by a base made from felt or similar material, which can be arranged below the pressure beam in a changeable position.

Patent Claims

1. Belt sanding machine for large-surface workpieces with a circulating, endless sanding belt pushed through an endless, circulating belt of steel or textile or plastic acting on its inner surface by means of a pressure device against the workpiece to be sanded and preferably to be continuously moved vertically to the longitudinal direction of the sanding belt, characterized in that lamella-like pressure strips (25) of glass beads and suchlike are arranged in intervals on the outer surface of the steel belt (23) and suchlike, and that the pressure device is formed as an elastic pressure beam (26) assuming the sanding length.

2. Belt sanding machine according to claim 1, characterized in that the pressure strips (25) are V-shaped and their peaks point into the running direction of the pressure belt (23).

/ad